

## ***Pleurocarpaea gracilis* (Asteraceae: Vernonieae), a new species from the Pilbara region of Western Australia**

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### **Abstract**

Lander, N.S. & Hurter, P.J.H. *Pleurocarpaea gracilis* (Asteraceae: Vernonieae), a new species from the Pilbara region of Western Australia. *Nuytsia* 23: 109–115 (2013). A new species of Asteraceae, *Pleurocarpaea gracilis* Lander & P.J.H. Hurter, is described from the Pilbara region of Western Australia. A key to all three species now included in *Pleurocarpaea* Benth. is provided.

### **Introduction**

Surveys of the extensive Banded Iron Formation ranges of the Pilbara region of Western Australia in recent years have led to the discovery of a significant number of plant taxa new to science. Amongst them is the new species described here, discovered in 1998 by Dr Stephen van Leeuwen at two isolated locations in the Hamersley Range of Western Australia, with subsequent specimens collected by Emil Thoma in 2011, Steven Kern in 2012 and Hayley Hughes in 2012.

A number of characteristics of the new species described here place it in the tribe Vernonieae Cass., notably its alternate leaves with undivided blades, corymbiform capitulescence, separate homogamous heads with perfect florets, style branches with stigmatic papillae covering the whole inner surface, and pappus of capillary bristles. The taxonomy of the Vernonieae is in a state of considerable flux. A comprehensive key to sub-tribes and genera of Vernonieae was provided by Robinson (2007). However, the overview of the tribe by Keeley and Robinson (2009) presents a substantial reorganisation of the former classification and the recognition of a number of new sub-tribes, amongst them the Linziinae S.C.Keeley & H.Rob.

Characters indicating that the new species belongs in the Linziinae include its suffruticose habit, stem indumentum with simple and L- or T-shaped hairs, alternate leaves with pinnate venation, persistent involucre bracts, epaleate receptacle, bluish corollas, glabrous anther appendages with somewhat thickened cell walls, and style appendages with acicular sweeping hairs. Although available specimens lack fully mature achenes, it otherwise fits broadly within the only genus of that sub-tribe native to Australia, namely *Pleurocarpaea* Benth. as re-described by Dunlop (1991). Given that the sites at which it has been found are difficult to access and little visited, the new species would seem best placed in *Pleurocarpaea* pending the availability of specimens with fully mature achenes and further research on Australian Vernonieae.

*Pleurocarpaea* is the only Australian endemic genus in the Vernoniaeae (Keeley & Robinson 2009). It was first described by Bentham (1867) from specimens collected by Robert Brown in 1803 with a single species, *P. denticulata* Benth., now known to have a range extending from Cape York Peninsula in Queensland to the North Kimberley in Western Australia. A second species first collected in 1972 and described by Dunlop (1991) as *P. fasciculata* Dunlop, is confined to Arnhem Land. Keeley and Robinson (2009: 457) remark that *Pleurocarpaea* has been isolated with no direct connection to another landmass within the time frame for Astereaceae evolution (maximum age *c.* 60 million years), and that it is 8,000 km from Australia to Africa where its nearest relatives are to be found.

### Methods

The descriptive terminology used in this paper follows Radford (1986). For more specific terms applied to the Asteraceae we have followed Roque *et al.* (2009). The map was prepared using the program DIVA-GIS (Hijmans *et al.* 2011). Distribution is summarised in terms of the *Interim Biogeographic Regionalisation for Australia (IBRA 6.1)* (Department of Sustainability, Environment, Water, Population and Communities 2000, revised 2004).

### Key to species of *Pleurocarpaea* (modified from Dunlop 1991)

- 1. Pappus of  $\pm$  30 capillary bristles to 3.8–4.9 mm long.....**P. gracilis**
- 1: Pappus absent or of 1–10 smooth or glandular-hairy bristles to 1 mm long, or bristles minute in a continuous ring
  - 2. Stems annual; leaves 5–50 mm wide; capitula 8–18 mm long (WA; NT; Qld).....**P. denticulata**
  - 2: Stems perennial; leaves 2–7 mm wide; capitula 6.4–8.0 mm long (Arnhem Land, NT).....**P. fasciculata**

### Taxonomy

***Pleurocarpaea gracilis*** Lander & P.J.H.Hurter, *sp. nov.*

*Type:* Hamersley Range, Western Australia [precise locality withheld for conservation reasons], 14 October 1998, *S. van Leeuwen* 4345 (*holo:* PERTH 06230512!, *iso:* BRI!, DNA!, K!).

*Genus* sp. Hamersley Range hilltops (*S. van Leeuwen* 4345), Western Australian Herbarium, in *FloraBase*, <http://florabase.dec.wa.gov.au> [accessed 16 January 2012].

Perennial suffruticose herb to 40 cm high. *Stems* divaricate, smooth, angular, without wings, weakly tomentose with submoniliform, rather L-shaped hairs, T-shaped hairs, and minutely stipitate glands. *Leaves* widely spaced, alternate, sessile, spreading; lamina elliptic, 1.8–9.1 mm long  $\times$  1.3–5.3 mm wide, strongly pinnately veined, punctate with minutely stipitate glands (appearing sessile) and scattered short moniliform hairs, denser abaxially; base cuneate; margins crenulate and undulate (crisp); apex obtuse, minutely apiculate. *Capitulescences* corymbose-paniculiform. *Heads* pedunculate, 0.7 cm wide, homogamous. *Involucral bracts* imbricate in 3–4 series, gradate, herbaceous; lamina narrowly obovate to narrowly elliptic, 1.6–3.1 mm long  $\times$  0.4–0.8 mm wide, densely pubescent dorsally with submoniliform, rather L-shaped hairs and apparently sessile glands; margins entire, ciliate; apex acute, mucronate. *Receptacle* shallowly convex, 2.4 mm diam., epaleate but with minute membranous chaffy projections. *Florets* 15 per head, tubular, overtopping the involucre at anthesis, perfect, narrowly infundibular, 5-lobed, blue to purple, 5.0–6.0 mm long; lobes narrowly acute, 2.3–2.5 mm long, erect;

dorsal surfaces densely covered with apparently sessile glands. *Anthers* coherent, 2.5–2.7 mm long; bases calcarate, ecaudate, sagittate, the auricles narrowly acute; staminal filaments inserted  $\pm$  midway down the corolla tube; filament collar (connective) shorter than the anther bases; apical appendages flat, acuminate, eglandular. *Styles* bifid, 6 mm long; base slightly swollen and sclerified; upper shaft and outer surfaces of branches densely hairy with uniseriate multicellular sweeping hairs; branches linear, 1.8 mm long, narrowly acute apically; appendages lacking; stigmatic papillae covering whole inner surface of branches. *Achenes* triquetrous, 0.8–1.5 mm long  $\times$  0.6–1.3 mm diam. apically and 0.2–0.3 mm basally;  $\pm$  densely sericeous throughout with long uniseriate multicellular hairs, and with scattered sessile multicellular glands becoming denser basally; carpodium a conspicuous ring of swollen cells. *Pappus* of c. 30  $\pm$  equal capillary bristles, 3.8–4.9 mm long, uniseriate. (Figures 1, 2A, B)

*Specimens examined.* WESTERN AUSTRALIA [localities withheld for conservation reasons]: 3 June 2012, *H. Hughes* Opp3-2 (PERTH); 9 May 2012, *S. Kern* WH12125-05 (PERTH); 9 May 2012, *S. Kern* Opp07 (PERTH); 14 May 2012, *S. Kern* Opp22 (PERTH); 4 June 2012, *S. Kern* Opp28 (PERTH); 16 May 2012, *S. Kern* Opp31 (PERTH); 5 June 2012, *S. Kern* Opp59 (PERTH); 7 July 2011, *E. Thoma* 1596 (PERTH, DNA); 15 Oct. 1998, *S. van Leeuwen* 4387 (PERTH).

*Flowering period.* May–October.

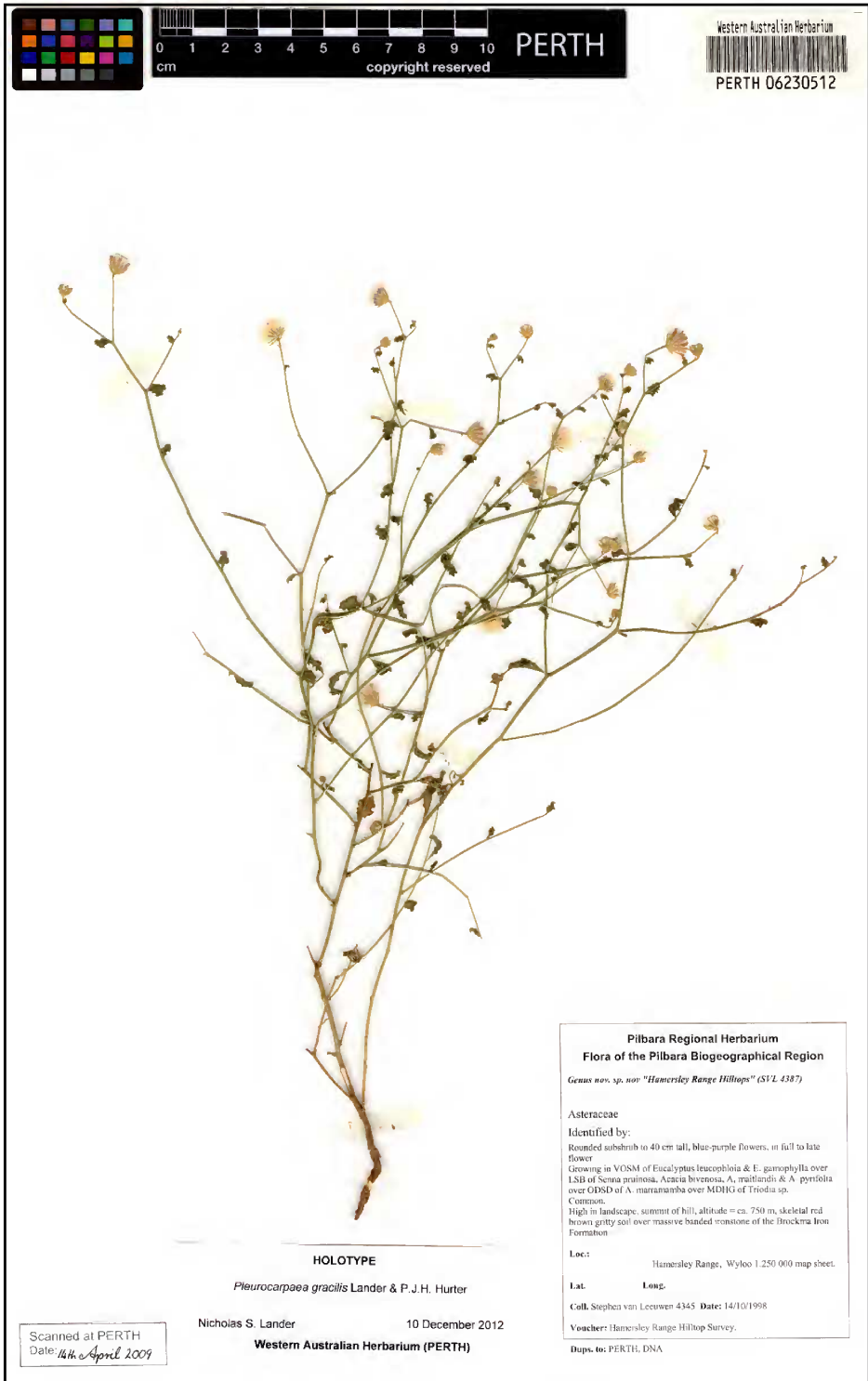
*Distribution.* Locally common at ten sites 2–51 km apart in the Hamersley sub-region of the Pilbara bioregion in the Eremaean Botanical Province of Western Australia (Figure 3).

*Habitat.* Summits, slopes and sheltered gullies of rounded hills in skeletal, red, gritty soil over massive banded ironstone of the Brockman Iron Formation; amongst woodland with *Eucalyptus*, *Acacia*, *Hakea*, *Triodia*, *Dampiera* and *Waltheria* species.

*Conservation status.* Priority Three under the Department of Environment and Conservation's (DEC) Conservation Codes for Western Australia Flora. Originally listed in 2003 as Priority One under *Genus* sp. Hamersley Range hilltops (*S. van Leeuwen* 4345) when it was only known from two summits of the Hamersley Range (Smith 2012). Since then this taxon has been found at only ten sites 2–51 km apart and is still in need of further survey.

*Etymology.* The specific epithet, *gracilis*, refers to the delicate habit of this species.

*Distinguishing features.* *Pleurocarpaea gracilis* shares with *P. fasciculata* its annual habit. The receptacle of *P. gracilis* is epaleate but with minute membranous chaffy projections, whereas those of both *P. denticulata* and *P. fasciculata* are paleate. *Pleurocarpaea gracilis* differs from both *P. denticulata* and *P. fasciculata* in possessing a pappus of  $\pm$  30 long rather than 1–10 short bristles which are sometimes lacking altogether. The pappus bristles of *P. gracilis* are capillary rather than smooth or glandular hairy (*P. denticulata*) or hairy (*P. fasciculata*).



**HOLOTYPE**

*Pleurocarpaea gracilis* Lander & P.J.H. Hurter

Nicholas S. Lander 10 December 2012  
Western Australian Herbarium (PERTH)

Scanned at PERTH  
Date: 14th April 2009

**Pilbara Regional Herbarium**  
**Flora of the Pilbara Biogeographical Region**  
*Genus nov. sp. nov. "Hamersley Range Hilltops" (SVL 4387)*

Asteraceae  
 Identified by:  
 Rounded subshrub to 40 cm tall, blue-purple flowers, in full to late flower  
 Growing in VOSM of Eucalyptus leucophloia & E. gamophylla over LSB of Sena pratensis, Acacia bivenosa, A. traidlandii & A. pyramidalis over ODSO of A. murrumbidgei over MDIG of Triodia sp.  
 Common.  
 High in landscape, summit of hill, altitude = ca. 750 m, skeletal red brown gritty soil over massive banded ironstone of the Brockwa Iron Formation

Loc.: Hamersley Range, Wyloo 1:250 000 map sheet.

Lat. Long.  
 Coll. Stephen van Leeuwen 4345 Date: 14/10/1998  
 Voucher: Hamersley Range Hilltop Survey.

Dups. to: PERTH, DNA

Figure 1. Holotype of *Pleurocarpaea gracilis*.



Figure 2. *Pleurocarpaea gracilis*. A – habit and habitat; B – detail. Photographs by Steve Kern, unvouchered.

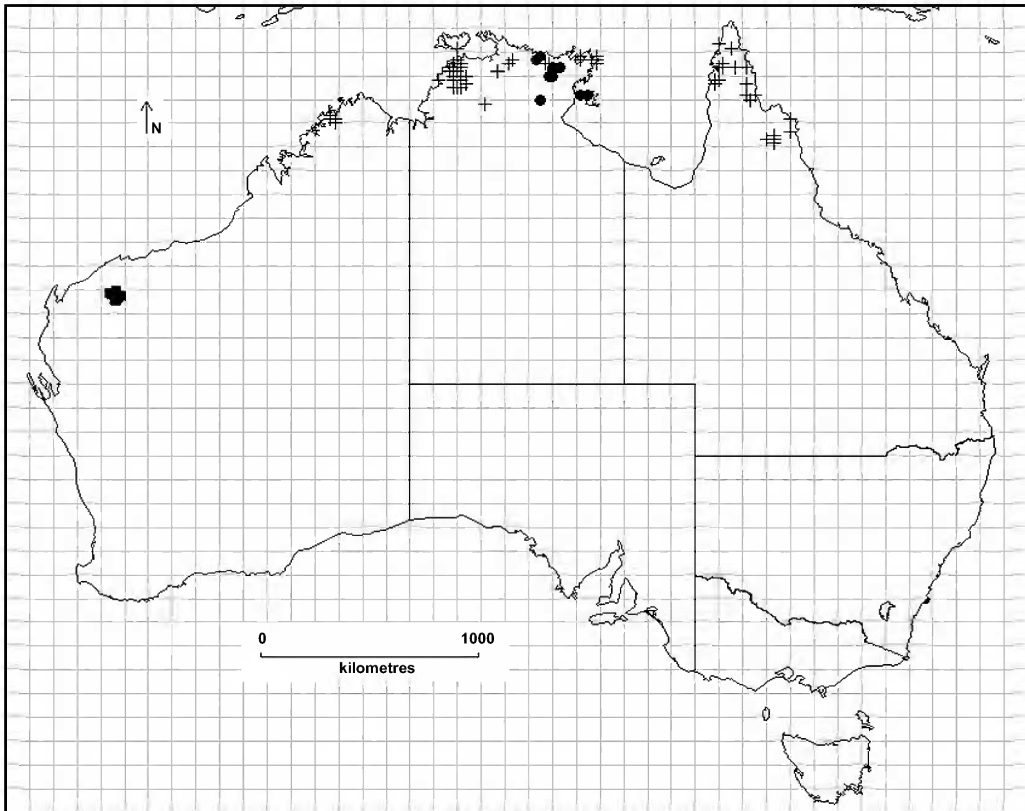


Figure 3. Distribution of *Pleurocarpaea gracilis* (■), *P. fasciculata* (●) and *P. denticulata* (+).

### Acknowledgements

We wish to thank Dr Stephen van Leeuwen for drawing this species to our attention, Emil Thoma at Rio Tinto, and Steve Kern and his colleagues at ecoscape for their collections and photographs. Permission to reproduce the latter here was graciously given by Fortescue Metals Group Ltd. We are grateful to Mr Paul Wilson who offered a number of useful comments on a draft of this paper.

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